

SEQUENCE LISTING

<110> Mathis, John P.

<120> Novel Bt Toxin Receptors and Methods of Use

<130> 35718/274644

<150> US 60/455,085

<151> 2003-03-14

<160> 10

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<211> 5765

<212> DNA

<213> Agrotis ipsilon

<220>

<221> CDS

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Val Ile Thr Asn Arg Gln Asp Tyr Glu Ala Gly Thr Trp Phe His Ala	
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Phe Thr Ile Arg Ile Asp Asn Glu Val Asp Ala Glu Val Met Leu Ala	
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Val Tyr Phe Thr Phe Tyr Asn Ser Gln Glu Ser Val Gln Glu His Arg	
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Pro Gln Phe Arg Asn Asp Tyr Phe Pro Pro Glu Gln Glu Ile Asp Met			
1705	1710	1715	
aat agc aac gat att gga tac cct gaa atg gat gcc cgc aac cca cta			5420
Asn Ser Asn Asp Ile Gly Tyr Pro Glu Met Asp Ala Arg Asn Pro Leu			
1720	1725	1730	
ccc aac cat gag aac aac ttt ggg tac agc aac gct ccc ttc aat cct			5468
Pro Asn His Glu Asn Asn Phe Gly Tyr Ser Asn Ala Pro Phe Asn Pro			
1735	1740	1745	1750
gat ttc act aat tca cag tca cgg aga taa gaagtaatag cttataaaca			5518
Asp Phe Thr Asn Ser Gln Ser Arg Arg *			
1755			
gtgttctttt tttttaata aagttaagaa tacacgccac tcctgtaatc ccagaagtta			5578
ggggtatgcc tcattatgcc tctcacattt tgaaacgcat gagtattaaa gttattatat			5638
tttttttttc aacatatcaa taagtacaac acaaatgtaa agatactcgt attattaaat			5698
aagtgaaaat aataattatt gttgaaaaaa aagtattgct tcatttaaaa aaaaaaaaaa			5758
aaaaaaa			5765

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<211> 1759

<212> PRT

<213> Agrotis epsilon

<400> 2

Met Gly Val Asp Val Arg Ile Leu Thr Ala Ala Leu Val Leu Leu Ala			
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Ala Ser Ser Thr Thr Ser Ala Gln Gly Met Pro Phe Glu Ser Arg Cys			
20	25	30	
Ala Tyr Met Thr Asp Ile Pro Arg Pro Asp Glu Arg Pro Glu Leu Pro			
35	40	45	
Pro Ile Ile Tyr Asp Gly Leu Ser Trp Asn Glu Arg Pro Leu Val Pro			
50	55	60	
Ala Asn Glu Asp Arg Leu Asp Val Cys Met Asp Glu Phe Phe Arg Gly			
65	70	75	80
Met Gln Tyr Ile Phe Met Glu Glu Glu Ile His Gly Asp Val Pro Ile			
85	90	95	
Ala Lys Leu Asn Tyr Ile Gly Asp Lys Ile Pro Tyr Val His Ser Thr			
100	105	110	
Phe Thr Val Gly Ser Phe Arg Leu Leu Gly Pro Glu Ile Arg Lys Ile			
115	120	125	
Ser Gly Asp Trp His Leu Val Ile Thr Asn Arg Gln Asp Tyr Glu Ala			
130	135	140	
Gly Thr Trp Phe His Ala Phe Thr Ile Arg Ile Asp Asn Glu Val Asp			
145	150	155	160
Ala Glu Val Met Leu Ala Ile Val Asn Ile Asp Asp Asn Asp Pro Leu			
165	170	175	
Ile Asp Leu Ser Glu Pro Cys Gln Ile Ala Glu Gln Arg Asp Ala Arg			
180	185	190	
Ser Val Lys Thr Cys Arg Tyr Ile Val His Asp Val Asp Gly Glu Ile			
195	200	205	
Ser Thr Arg Phe Met Arg Tyr Glu Ile Glu Ser Gly Arg Gly Asp Glu			

210					215					220						
Glu	Val	Phe	Ser	Leu	Val	Arg	Glu	Gln	Ala	Pro	Asn	Asn	Glu	Trp	Met	
225					230					235						240
Trp	Cys	Tyr	Met	Val	Val	Glu	Val	Lys	Gly	Ser	Leu	Asp	Phe	Ala	Gln	
				245					250							255
Asn	Pro	Leu	His	Ile	Phe	Arg	Ala	His	Ala	Phe	Asp	Ser	Lys	Asp	Asn	
			260					265					270			
Thr	His	Ser	Val	Leu	Met	Thr	Val	Glu	Val	Lys	Asn	Val	Glu	Gln	Arg	
		275					280					285				
Pro	Pro	Gln	Trp	Ile	Glu	Ile	Phe	Ala	Val	Gln	Gln	Phe	Asp	Glu	Lys	
	290					295				300						
Ile	Lys	Lys	Ser	Phe	Arg	Val	Arg	Ala	Ile	Asp	Ala	Asp	Thr	Gly	Ile	
305					310					315						320
Asn	Lys	Thr	Ile	Ser	Tyr	Arg	Leu	Arg	Thr	Ala	Val	Gly	Glu	Glu	Asn	
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Leu	Phe	Glu	Leu	Glu	Thr	Lys	Glu	Gly	Ser	Gln	Gly	Val	Trp	Leu	His	
			340					345					350			
Val	Gly	Pro	Ile	Asp	Arg	Asp	Glu	Leu	Glu	Lys	Glu	Val	Phe	Leu	Leu	
		355					360					365				
Ser	Ile	Ile	Ala	Tyr	Lys	Tyr	Gly	Asp	Asp	Gly	Thr	Leu	Tyr	Glu	Thr	
	370					375				380						
Pro	Ala	Asn	Ile	Thr	Ile	Ile	Ile	Asn	Asp	Val	Asn	Asp	Gln	Leu	Pro	
385					390					395						400
Ser	Pro	Leu	Lys	Glu	Gly	Gly	Val	Tyr	Thr	Ile	Asp	Ile	Met	Glu	Glu	
			405						410					415		
Thr	Pro	Met	Thr	Leu	Asn	Leu	Glu	Asn	Phe	Gly	Phe	His	Asp	Arg	Asp	
			420					425					430			
Leu	Gly	Pro	Asn	Ala	Gln	Tyr	Asn	Val	Arg	Leu	Glu	Ser	Val	Tyr	Pro	
		435					440					445				
Asp	Gly	Val	His	Glu	Ala	Phe	Tyr	Ile	Ala	Pro	Glu	Arg	Gly	Tyr	Gln	
	450					455				460						
Arg	Gln	Ser	Phe	Phe	Leu	Ser	Thr	Gln	Asn	His	His	Met	Leu	Asp	Tyr	
465					470					475						480
Asp	Asn	Glu	Thr	Val	Asp	Phe	Thr	Lys	Ile	Gln	Ile	Lys	Ala	Val	Ala	
			485						490					495		
Ile	Asp	Ser	Leu	Asn	Asn	Thr	Met	Lys	Gly	Phe	Ala	Thr	Ile	Asn	Ile	
			500					505					510			
Asn	Leu	Ile	Asn	Trp	Asn	Asp	Glu	Leu	Pro	Ile	Phe	Lys	Asn	Ser	Val	
		515					520					525				
Gln	Asn	Val	Ser	Phe	Pro	Glu	Thr	Val	Ala	Ala	Gly	Phe	His	Val	Ala	
	530					535					540					
Thr	Ile	Lys	Ala	Glu	Asp	Arg	Asp	Val	Gly	Asp	Arg	Val	Glu	His	Ser	
545					550					555						560
Leu	Met	Gly	Asn	Ala	Val	Asp	Phe	Leu	Thr	Ile	Asp	Lys	Tyr	Ser	Gly	
			565						570					575		
Glu	Ile	Phe	Val	Ala	Val	Asn	Asn	Ser	Phe	Asn	Tyr	His	Arg	Gln	Asn	
			580					585					590			
Glu	Leu	Phe	Ile	Gln	Ile	Arg	Ala	Asp	Asp	Thr	Leu	Gly	Glu	Gly	Pro	
		595					600					605				
Tyr	His	Thr	Thr	Thr	Ser	Gln	Leu	Val	Ile	Tyr	Leu	Glu	Asp	Val	Asn	
	610					615					620					
Asn	Thr	Pro	Pro	Val	Leu	Arg	Leu	Pro	Arg	Arg	Gly	Pro	His	Val	Glu	
625					630					635						640
Glu	Asn	Val	Pro	His	Gly	His	Pro	Ile	Thr	Asn	Asp	Asp	Gly	Ile	Gln	
				645					650					655		
Leu	Ile	Ala	Ser	Asp	Pro	Asp	Thr	Thr	Ala	Glu	Leu	Trp	Phe	Glu	Ile	
			660				665						670			

Asp	Trp	Glu	Glu	Ser	Tyr	Ala	Thr	Lys	Gln	Gly	Asn	Glu	Thr	Leu	Lys	675	680	685
Asp	Glu	Tyr	Arg	Asn	Cys	Ile	Glu	Ile	Leu	Thr	Arg	Tyr	Gln	Asp	Glu	690	695	700
Asn	Arg	Lys	Gly	Glu	Ala	Tyr	Gly	Val	Leu	Glu	Val	Arg	Gln	Ile	Arg	705	710	715
Asp	Asp	Pro	Val	Val	Thr	Ile	Asp	Tyr	Glu	Glu	Phe	Glu	Val	Leu	Tyr	720	725	730
Leu	Val	Val	Arg	Val	Arg	Asp	Arg	Asn	Thr	Thr	Leu	Gly	Asp	Asp	Tyr	735	740	745
Asp	Glu	Gly	Thr	Leu	Thr	Ile	Thr	Ile	Ile	Asp	Met	Asn	Asp	Asn	Trp	750	755	760
Pro	Thr	Trp	Glu	Glu	Gly	Gln	Leu	Thr	Gln	Gln	Phe	Arg	Val	Arg	Glu	765	770	775
Met	Ser	Leu	Ser	Gly	Val	Val	Ile	Gly	Ser	Leu	Arg	Ala	Thr	Asp	Arg	780	785	790
Asp	Gly	Pro	Leu	Tyr	Asn	Gln	Val	Arg	Tyr	Thr	Ile	Gln	Pro	Val	Asp	795	800	805
Gly	Thr	Pro	Ala	Asp	Leu	Val	Ala	Ile	Asp	Phe	Arg	Thr	Gly	Gln	Met	810	815	820
Thr	Val	Gln	Lys	Asn	Gln	Ala	Ile	Asp	Ala	Asp	Val	Pro	Pro	Arg	Phe	825	830	835
Asn	Leu	Tyr	Tyr	Thr	Val	Thr	Ala	Ser	Asp	Lys	Cys	Ser	Met	Glu	Asp	840	845	850
Gln	Ser	Asn	Cys	Pro	Asp	Asp	Lys	Thr	Tyr	Trp	Asn	Thr	Thr	Ala	Lys	855	860	865
Ile	Ala	Ile	Gln	Val	Ile	Asp	Thr	Asn	Asn	Lys	Val	Pro	Phe	Val	Glu	870	875	880
Pro	Glu	Lys	Phe	Lys	Asn	Glu	Val	Thr	Ile	Val	Glu	Asp	Pro	Val	Thr	885	890	895
Gly	Asp	Val	Thr	Phe	Leu	Thr	Ser	Glu	Ser	Ile	Tyr	Glu	Asp	Ala	Val	900	905	910
Ser	Gly	Asp	His	Val	Phe	Gln	Leu	Phe	Val	Gly	Asp	Leu	Asp	Arg	Asp	915	920	925
Leu	Pro	Asn	Asn	Asn	Val	Ser	Tyr	Thr	Ile	Asn	Phe	Gly	Val	Asn	Pro	930	935	940
Arg	Ile	Arg	Asp	Phe	Phe	Glu	Val	Asp	Leu	Val	Thr	Gly	Trp	Val	Arg	945	950	955
Val	His	Tyr	Pro	Gly	Pro	Asp	Lys	Leu	Asp	Arg	Asp	Gly	Asp	Glu	Pro	960	965	970
Thr	His	Arg	Ile	His	Phe	Ser	Ile	Phe	Asp	Asn	Phe	Met	Ser	Glu	Gly	975	980	985
Glu	Pro	Asn	Arg	Asn	Gln	Ile	Ser	Gly	Glu	Ala	Leu	Ile	Ile	Leu	Leu	990	995	1000
Asp	Val	Asn	Asp	Asn	Lys	Pro	Glu	Leu	Pro	Ser	Pro	Asp	Ser	Phe	Pro	1005	1010	1015
Pro	Trp	Thr	Val	Ser	Glu	Ser	Val	Val	Glu	Gly	Val	Arg	Ile	Pro	Pro	1020	1025	1030
Glu	Ile	Leu	Ala	Pro	Asp	Arg	Asp	Glu	Pro	Gly	Thr	Asp	Asn	Ser	Arg	1035	1040	1045
Val	Ala	Tyr	Asp	Leu	Leu	Gly	Val	Thr	Pro	Glu	Arg	Asp	Ile	Glu	Val	1050	1055	1060
Pro	Gln	Leu	Phe	Lys	Ile	Glu	Thr	Ile	Glu	Lys	Asp	Leu	Gly	Ile	Asn	1065	1070	1075
Gln	Thr	Gly	Ile	Leu	Glu	Thr	Val	Thr	Pro	Leu	Gln	Gly	Tyr	Trp	Gly	1080	1085	1090
Thr	Tyr	Glu	Ile	His	Ile	Lys	Ala	Phe	Asp	His	Gly	Asp	Pro	Arg	Gln	1095	1100	1105

										1125			1130			1135		
Glu	Ser	Asp	Glu	Lys	Tyr	Gln	Leu	Val	Val	Arg	Pro	Tyr	Asn	Phe	His			
										1140			1145			1150		
Glu	Pro	Thr	Phe	Val	Phe	Pro	Leu	Asp	Gly	Ser	Ala	Ile	Arg	Leu	Ser			
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Arg	Asp	Arg	Ala	Ile	Val	Ser	Gly	Glu	Leu	Thr	Val	Val	Gly	Ala	Ala			
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Gln	Ala	Pro	Leu	Gln	Arg	Ile	Ser	Ala	Thr	Asp	Glu	Asp	Gly	Leu	His			
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Ala	Gly	Thr	Val	Ser	Phe	Ser	Val	Val	Gly	Asp	Asp	Glu	Ala	Met	Asn			
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Tyr	Phe	Asp	Val	Trp	Asn	Asp	Gly	Glu	Asn	Ser	Gly	Met	Leu	Ala	Leu			
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Lys	Gln	Ala	Leu	Pro	Asp	Gly	Phe	Gln	Glu	Phe	Lys	Leu	Thr	Ile	Arg			
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Ala	Thr	Asp	Ala	Gly	Asp	Glu	Pro	Gly	Pro	Lys	Ser	Thr	Asp	Ser	Thr			
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Val	Thr	Val	Val	Phe	Ile	Pro	Gln	Val	Glu	Pro	Gln	Phe	Pro	Thr	Asn			
										1265			1270			1275		
Thr	Gln	Glu	Val	Ala	Phe	Ile	Glu	Phe	Glu	Ala	Gly	Arg	Ser	Glu	Arg			
										1285			1290			1295		
His	Glu	Leu	Thr	Ala	Ala	Val	Asp	Gln	Lys	Asn	Ile	Leu	Cys	Asp	Ile			
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Asp	Cys	Tyr	Thr	Val	Tyr	Tyr	Thr	Ile	Ile	Gly	Gly	Asn	Ala	Ala	Gly			
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His	Phe	Ala	Leu	Asp	Gly	Asn	Val	Leu	Tyr	Leu	Val	Ser	Glu	Leu	Asp			
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Arg	Ala	Gln	Ala	Glu	Arg	His	Thr	Leu	Gln	Val	Ala	Ala	Ser	Asn	Val			
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Pro	Gly	Val	Thr	Thr	Ala	Ala	Pro	Ala	Ser	Thr	Leu	Thr	Val	Ile	Val			
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Thr	Val	Arg	Glu	Ala	Asn	Pro	Arg	Pro	His	Phe	Glu	Arg	Asn	Leu	Tyr			
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Thr	Thr	Gly	Met	Ser	Ala	Thr	Asp	Thr	Asp	Ser	Glu	Arg	Pro	Leu	Leu			
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Thr	Val	Ser	Ala	Thr	His	Ser	Glu	Gly	Leu	Pro	Ile	Thr	Tyr	Ala	Ile			
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Asp	Gln	Asp	Ser	Met	Val	Leu	Asp	Pro	Thr	Leu	Glu	Gln	Val	Arg	Glu			
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Ser	Ala	Phe	Ser	Met	Asn	Pro	Glu	Thr	Gly	Glu	Leu	Met	Arg	Met	Ile			
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Gln	Pro	Asn	Ala	Asn	Met	His	Gly	Met	Phe	Glu	Phe	Asp	Ile	Leu	Ala			
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Thr	Asp	Thr	Ala	Gly	Ala	Thr	Gly	Gln	Ser	His	Val	Lys	Val	Tyr	Leu			
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Ile	Ser	Ser	Arg	Asn	Arg	Val	Tyr	Phe	Thr	Phe	Tyr	Asn	Ser	Gln	Glu			
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Ser	Val	Gln	Glu	His	Arg	Thr	Phe	Ile	Ala	Gln	Thr	Phe	Thr	Arg	Val			
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Tyr	Ser	Met	Thr	Cys	Asn	Ile	Glu	Asp	Ile	Val	Pro	Ala	Thr	Asp	Ser			
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Asn	Gly	Gln	Tyr	Leu	Thr	Thr	Glu	Thr	His	Val	Thr	Ala	His	Phe	Ile			
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Arg	Asp	Asp	Leu	Pro	Val	Asp	Ala	Asp	Asp	Val	Gln	Glu	Leu	Ile	Glu			
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Asp	Thr	Glu	Leu	Phe	Arg	Glu	Leu	Arg	Thr	Thr	Met	Leu	Gly	Leu	Gly			
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Leu Gln Leu Thr Asn Val Gln Ser Gly Leu Pro Pro Ser Val Ala Gly
 1585 1590 1595 1600
 Glu Asp Gln Met Leu Ala Val Tyr Ile Leu Ala Gly Leu Ala Gly Val
 1605 1610 1615
 Leu Ala Leu Leu Cys Ile Val Leu Leu Ile Thr Phe Ile Ile Arg Asn
 1620 1625 1630
 Arg Ser Leu Asn Arg Arg Ile Ala Ala Leu Ser Ala Thr Lys Tyr Asn
 1635 1640 1645
 Ser Val Asp Ser Asn Leu Asn Arg Ile Gly Leu Ala Ala Pro Gly Thr
 1650 1655 1660
 Asn Lys His Ala Phe Glu Pro Asn Pro Ile Trp Asn Glu Thr Ile Lys
 1665 1670 1675 1680
 Ala Pro Asp Phe Asp Ala Ile Ser Glu Gln Ser Asn Asp Ser Asp Leu
 1685 1690 1695
 Ile Gly Ile Glu Asp Leu Pro Gln Phe Arg Asn Asp Tyr Phe Pro Pro
 1700 1705 1710
 Glu Gln Glu Ile Asp Met Asn Ser Asn Asp Ile Gly Tyr Pro Glu Met
 1715 1720 1725
 Asp Ala Arg Asn Pro Leu Pro Asn His Glu Asn Asn Phe Gly Tyr Ser
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 Asn Ala Pro Phe Asn Pro Asp Phe Thr Asn Ser Gln Ser Arg Arg
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<220>
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 <223> h = A, C, or T

<221> misc_feature
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24

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 <223> r = G or A

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21

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21

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 Thr Ala Thr Ala Gln Arg Asp Arg Cys Gly Tyr Met Val Glu Ile Pro
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Ala	Val	Ala	Ile	Asp	Arg	His	Asp	Asn	Asn	His	Ile	Gly	Glu	Ala	Ile	
				500					505					510		
Ile	Asn	Ile	Asn	Leu	Ile	Asn	Trp	Asn	Asp	Glu	Leu	Pro	Ile	Phe	Asp	
				515					520					525		
Glu	Asp	Ala	Tyr	Asn	Val	Thr	Phe	Glu	Glu	Thr	Val	Gly	Asp	Gly	Phe	
				530					535					540		
His	Ile	Gly	Lys	Tyr	Arg	Ala	Lys	Asp	Arg	Asp	Ile	Gly	Asp	Ile	Val	
545					550					555					560	
Glu	His	Ser	Ile	Leu	Gly	Asn	Ala	Ala	Asn	Phe	Leu	Arg	Ile	Asp	Ile	
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Asp	Thr	Gly	Asp	Val	Tyr	Val	Ser	Arg	Asp	Asp	Tyr	Phe	Asp	Tyr	Gln	
				580					585					590		
Arg	Gln	Asn	Glu	Ile	Ile	Val	Gln	Ile	Leu	Ala	Val	Asp	Thr	Leu	Gly	
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Leu	Pro	Gln	Asn	Arg	Ala	Thr	Thr	Gln	Leu	Thr	Ile	Phe	Leu	Glu	Asp	
				610					615					620		
Ile	Asn	Asn	Thr	Pro	Pro	Ile	Leu	Arg	Leu	Pro	Arg	Ser	Ser	Pro	Ser	
625					630					635					640	
Val	Glu	Glu	Asn	Val	Glu	Val	Gly	His	Pro	Ile	Thr	Glu	Gly	Leu	Thr	
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Ala	Thr	Asp	Pro	Asp	Thr	Thr	Ala	Asp	Leu	His	Phe	Glu	Ile	Asp	Trp	
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Asp	Asn	Ser	Tyr	Ala	Thr	Lys	Gln	Gly	Thr	Asn	Gly	Pro	Asn	Thr	Ala	
				675					680					685		
Asp	Tyr	His	Gly	Cys	Val	Glu	Ile	Leu	Thr	Val	Tyr	Pro	Asp	Pro	Asp	
				690					695					700		
Asn	His	Gly	Arg	Ala	Glu	Gly	His	Leu	Val	Ala	Arg	Glu	Val	Ser	Asp	
705					710					715					720	
Gly	Val	Thr	Ile	Asp	Tyr	Glu	Lys	Phe	Glu	Val	Leu	Tyr	Leu	Val	Val	
				725					730					735		
Arg	Val	Ile	Asp	Arg	Asn	Thr	Val	Ile	Gly	Pro	Asp	Tyr	Asp	Glu	Ala	
				740					745					750		
Met	Leu	Thr	Val	Thr	Ile	Ile	Asp	Met	Asn	Asp	Asn	Trp	Pro	Ile	Trp	
				755					760					765		
Ala	Asp	Asn	Thr	Leu	Gln	Gln	Thr	Leu	Arg	Val	Arg	Glu	Met	Ala	Asp	
				770					775					780		
Glu	Gly	Val	Ile	Val	Gly	Thr	Leu	Leu	Ala	Thr	Asp	Leu	Asp	Gly	Pro	
785					790					795					800	
Leu	Tyr	Asn	Arg	Val	Arg	Tyr	Thr	Met	Val	Pro	Ile	Lys	Asp	Thr	Pro	
				805					810					815		
Asp	Asp	Leu	Ile	Ala	Ile	Asn	Tyr	Val	Thr	Gly	Gln	Leu	Thr	Val	Asn	
				820					825					830		
Lys	Gly	Gln	Ala	Ile	Asp	Ala	Asp	Asp	Pro	Pro	Arg	Phe	Tyr	Leu	Tyr	
				835					840					845		
Tyr	Lys	Val	Thr	Ala	Ser	Asp	Lys	Cys	Ser	Leu	Asp	Glu	Phe	Phe	Pro	
				850					855					860		
Val	Cys	Pro	Pro	Asp	Pro	Thr	Tyr	Trp	Asn	Thr	Glu	Gly	Glu	Ile	Ala	
865					870					875					880	
Ile	Ala	Ile	Thr	Asp	Thr	Asn	Asn	Lys	Ile	Pro	Arg	Ala	Glu	Thr	Asp	
				885					890					895		

Asn	Phe	Phe	Ala	Val	Asp	Pro	Asp	Thr	Gly	Glu	Leu	Phe	Val	His	Phe	945	950	955	960
Thr	Thr	Ser	Glu	Val	Leu	Asp	Arg	Asp	Gly	Glu	Glu	Pro	Glu	His	Arg	965	970	975	
Ile	Ile	Phe	Thr	Ile	Val	Asp	Asn	Leu	Glu	Gly	Ala	Gly	Asp	Gly	Asn	980	985	990	
Gln	Asn	Thr	Ile	Ser	Thr	Glu	Val	Arg	Val	Ile	Leu	Leu	Asp	Ile	Asn	995	1000	1005	
Asp	Asn	Lys	Pro	Glu	Leu	Pro	Ile	Pro	Asp	Gly	Glu	Phe	Trp	Thr	Val	1010	1015	1020	
Ser	Glu	Gly	Glu	Val	Glu	Gly	Lys	Arg	Ile	Pro	Pro	Glu	Ile	His	Ala	1025	1030	1035	1040
His	Asp	Arg	Asp	Glu	Pro	Phe	Asn	Asp	Asn	Ser	Arg	Val	Gly	Tyr	Glu	1045	1050	1055	
Ile	Arg	Ser	Ile	Lys	Leu	Ile	Asn	Arg	Asp	Ile	Glu	Leu	Pro	Gln	Asp	1060	1065	1070	
Pro	Phe	Lys	Ile	Ile	Thr	Ile	Asp	Asp	Leu	Asp	Thr	Trp	Lys	Phe	Val	1075	1080	1085	
Gly	Glu	Leu	Glu	Thr	Thr	Met	Asp	Leu	Arg	Gly	Tyr	Trp	Gly	Thr	Tyr	1090	1095	1100	
Asp	Val	Glu	Ile	Arg	Ala	Phe	Asp	His	Gly	Phe	Pro	Met	Leu	Asp	Ser	1105	1110	1115	1120
Phe	Glu	Thr	Tyr	Gln	Leu	Thr	Val	Arg	Pro	Tyr	Asn	Phe	His	Ser	Pro	1125	1130	1135	
Val	Phe	Val	Phe	Pro	Thr	Pro	Gly	Ser	Thr	Ile	Arg	Leu	Ser	Arg	Glu	1140	1145	1150	
Arg	Ala	Ile	Val	Asn	Gly	Met	Leu	Ala	Leu	Ala	Asn	Ile	Ala	Ser	Gly	1155	1160	1165	
Glu	Phe	Leu	Asp	Arg	Leu	Ser	Ala	Thr	Asp	Glu	Asp	Gly	Leu	His	Ala	1170	1175	1180	
Gly	Arg	Val	Thr	Phe	Ser	Ile	Ala	Gly	Asn	Asp	Glu	Ala	Ala	Glu	Tyr	1185	1190	1195	1200
Phe	Asn	Val	Leu	Asn	Asp	Gly	Asp	Asn	Ser	Ala	Met	Leu	Thr	Leu	Lys	1205	1210	1215	
Gln	Ala	Leu	Pro	Ala	Gly	Val	Gln	Gln	Phe	Glu	Leu	Val	Ile	Arg	Ala	1220	1225	1230	
Thr	Asp	Gly	Gly	Thr	Glu	Pro	Gly	Pro	Arg	Ser	Thr	Asp	Cys	Ser	Val	1235	1240	1245	
Thr	Val	Val	Phe	Val	Met	Thr	Gln	Gly	Asp	Pro	Val	Phe	Asp	Asp	Asn	1250	1255	1260	
Ala	Ala	Ser	Val	Arg	Phe	Val	Glu	Lys	Glu	Ala	Gly	Met	Ser	Glu	Lys	1265	1270	1275	1280
Phe	Gln	Leu	Pro	Gln	Ala	Asp	Asp	Pro	Lys	Asn	Tyr	Arg	Cys	Met	Asp	1285	1290	1295	
Asp	Cys	His	Thr	Ile	Tyr	Tyr	Ser	Ile	Val	Asp	Gly	Asn	Asp	Gly	Asp	1300	1305	1310	
His	Phe	Ala	Val	Glu	Pro	Glu	Thr	Asn	Val	Ile	Tyr	Leu	Leu	Lys	Pro	1315	1320	1325	
Leu	Asp	Arg	Ser	Gln	Gln	Glu	Gln	Tyr	Arg	Val	Val	Val	Ala	Ala	Ser	1330	1335	1340	
Asn	Thr	Pro	Gly	Gly	Thr	Ser	Thr	Leu	Ser	Ser	Ser	Leu	Leu	Thr	Val	1345	1350	1355	1360
Thr	Ile	Gly	Val	Arg	Glu	Ala	Asn	Pro	Arg	Pro	Ile	Phe	Glu	Ser	Glu	1365	1370	1375	
Phe	Tyr	Thr	Ala	Gly	Val	Leu	His	Thr	Asp	Ser	Ile	His	Lys	Glu	Leu	1380	1385	1390	
Val	Tyr	Leu	Ala	Ala	Lys	His	Ser	Glu	Gly	Leu	Pro	Ile	Val	Tyr	Ser				

1395	1400	1405
Ile Asp Gln Glu Thr Met Lys	Ile Asp Glu Ser Leu Gln Thr Val Val	
1410	1415	1420
Glu Asp Ala Phe Asp Ile Asn Ser Ala Thr Gly Val Ile Ser Leu Asn		
1425	1430	1435
Phe Gln Pro Thr Ser Val Met His Gly Ser Phe Asp Phe Glu Val Val		1440
1445	1450	1455
Ala Ser Asp Thr Arg Gly Ala Ser Asp Arg Ala Lys Val Ser Ile Tyr		
1460	1465	1470
Met Ile Ser Thr Arg Val Arg Val Ala Phe Leu Phe Tyr Asn Thr Glu		
1475	1480	1485
Ala Glu Val Asn Glu Arg Arg Asn Phe Ile Ala Gln Thr Phe Ala Asn		
1490	1495	1500
Ala Phe Gly Met Thr Cys Asn Ile Asp Ser Val Leu Pro Ala Thr Asp		
1505	1510	1515
Ala Asn Gly Val Ile Arg Glu Gly Tyr Thr Glu Leu Gln Ala His Phe		1520
1525	1530	1535
Ile Arg Asp Asp Gln Pro Val Pro Ala Asp Tyr Ile Glu Gly Leu Phe		
1540	1545	1550
Thr Glu Leu Asn Thr Leu Arg Asp Ile Arg Glu Val Leu Ser Thr Gln		
1555	1560	1565
Gln Leu Thr Leu Leu Asp Phe Ala Ala Gly Gly Ser Ala Val Leu Pro		
1570	1575	1580
Gly Gly Glu Tyr Ala Leu Ala Val Tyr Ile Leu Ala Gly Ile Ala Ala		
1585	1590	1595
Leu Leu Ala Val Ile Cys Leu Ala Leu Leu Ile Ala Phe Phe Ile Arg		1600
1605	1610	1615
Asn Arg Thr Leu Asn Arg Arg Ile Glu Ala Leu Thr Ile Lys Asp Val		
1620	1625	1630
Pro Thr Asp Ile Glu Pro Asn His Ala Ser Val Ala Val Leu Asn Ile		
1635	1640	1645
Asn Lys His Thr Glu Pro Gly Ser Asn Pro Phe Tyr Asn Pro Asp Val		
1650	1655	1660
Lys Thr Pro Asn Phe Asp Thr Ile Ser Glu Val Ser Asp Asp Leu Leu		
1665	1670	1675
Asp Val Glu Asp Leu Glu Gln Phe Gly Lys Asp Tyr Phe Pro Pro Glu		1680
1685	1690	1695
Asn Glu Ile Glu Ser Leu Asn Phe Ala Arg Asn Pro Ile Ala Thr His		
1700	1705	1710
Gly Asn Asn Phe Gly Val Asn Ser Ser Pro Ser Asn Pro Glu Phe Ser		
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Asn Ser Gln Phe Arg Ser		
1730		

<210> 7

<211> 1730

<212> PRT

<213> Helicoverpa zea

<400> 7

Met Ala Val Asp Val Arg Ile Leu Thr Ala Ala Val Phe Ile Ile Ala	
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Ala His Leu Thr Phe Ala Gln Asp Cys Ser Tyr Met Val Ala Ile Pro	
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Arg Pro Glu Arg Pro Asp Phe Pro Ser Leu Asn Phe Asp Gly Ile Pro	
35	40
	45

Trp	Ser	Arg	Tyr	Pro	Leu	Ile	Pro	Val	Glu	Gly	Arg	Glu	Asp	Val	Cys	50	55	60
Met	Asn	Glu	Phe	Gln	Pro	Asp	Ala	Leu	Asn	Pro	Val	Thr	Val	Ile	Phe	65	70	75
Met	Glu	Glu	Glu	Ile	Glu	Gly	Asp	Val	Ala	Ile	Ala	Arg	Leu	Asn	Tyr	85	90	95
Arg	Gly	Thr	Asn	Thr	Pro	Thr	Ile	Val	Ser	Pro	Phe	Ser	Phe	Gly	Thr	100	105	110
Phe	Asn	Met	Leu	Gly	Pro	Val	Ile	Arg	Arg	Ile	Pro	Glu	Asn	Gly	Gly	115	120	125
Asp	Trp	His	Leu	Val	Ile	Thr	Gln	Arg	Gln	Asp	Tyr	Glu	Thr	Pro	Gly	130	135	140
Met	Gln	Gln	Tyr	Ile	Phe	Asp	Val	Arg	Val	Asp	Asp	Glu	Pro	Leu	Val	145	150	155
Ala	Thr	Val	Met	Leu	Leu	Ile	Val	Asn	Ile	Asp	Asp	Asn	Asp	Pro	Ile	165	170	175
Ile	Gln	Met	Phe	Glu	Pro	Cys	Asp	Ile	Pro	Glu	Arg	Gly	Glu	Thr	Gly	180	185	190
Ile	Thr	Ser	Cys	Lys	Tyr	Thr	Val	Ser	Asp	Ala	Asp	Gly	Glu	Ile	Ser	195	200	205
Thr	Arg	Phe	Met	Arg	Phe	Glu	Ile	Ser	Ser	Asp	Arg	Asp	Asp	Asp	Glu	210	215	220
Tyr	Phe	Glu	Leu	Val	Arg	Glu	Asn	Ile	Gln	Gly	Gln	Trp	Met	Tyr	Val	225	230	235
His	Met	Arg	Val	His	Val	Lys	Lys	Pro	Leu	Asp	Tyr	Glu	Glu	Asn	Pro	245	250	255
Leu	His	Leu	Phe	Arg	Val	Thr	Ala	Tyr	Asp	Ser	Leu	Pro	Asn	Thr	His	260	265	270
Thr	Val	Thr	Met	Met	Val	Gln	Val	Glu	Asn	Val	Glu	Asn	Arg	Pro	Pro	275	280	285
Arg	Trp	Met	Glu	Ile	Phe	Ala	Val	Gln	Gln	Phe	Asp	Glu	Lys	Thr	Glu	290	295	300
Gln	Ser	Phe	Arg	Val	Arg	Ala	Ile	Asp	Gly	Asp	Thr	Gly	Ile	Asp	Lys	305	310	315
Pro	Ile	Phe	Tyr	Arg	Ile	Glu	Thr	Glu	Lys	Gly	Glu	Glu	Asp	Leu	Phe	325	330	335
Ser	Ile	Gln	Thr	Ile	Glu	Gly	Gly	Arg	Glu	Gly	Ala	Trp	Phe	Asn	Val	340	345	350
Ala	Pro	Ile	Asp	Arg	Asp	Thr	Leu	Glu	Lys	Glu	Val	Phe	His	Val	Ser	355	360	365
Ile	Ile	Ala	Tyr	Lys	Tyr	Gly	Asp	Asn	Asp	Val	Glu	Gly	Ser	Ser	Ser	370	375	380
Phe	Gln	Ser	Lys	Thr	Asp	Val	Val	Ile	Ile	Val	Asn	Asp	Val	Asn	Asp	385	390	395
Gln	Ala	Pro	Leu	Pro	Phe	Arg	Glu	Glu	Tyr	Ser	Ile	Glu	Ile	Met	Glu	405	410	415
Glu	Thr	Ala	Met	Thr	Leu	Asn	Leu	Glu	Asp	Phe	Gly	Phe	His	Asp	Arg	420	425	430
Asp	Leu	Gly	Pro	His	Ala	Gln	Tyr	Thr	Val	His	Leu	Glu	Ser	Ile	His	435	440	445
Pro	Pro	Arg	Ala	His	Glu	Ala	Phe	Tyr	Ile	Ala	Pro	Glu	Val	Gly	Tyr	450	455	460
Gln	Arg	Gln	Ser	Phe	Ile	Met	Gly	Thr	Gln	Asn	His	His	Met	Leu	Asp	465	470	475
Phe	Glu	Val	Pro	Glu	Phe	Gln	Asn	Ile	Gln	Leu	Arg	Ala	Val	Ala	Ile	485	490	495
Asp	Met	Asp	Asp	Pro	Lys	Trp	Val	Gly	Ile	Ala	Ile	Ile	Asn	Ile	Lys			

Asp	Arg	Asp	Gly	Asp	Glu	Pro	Thr	His	Arg	Ile	Phe	Phe	Asn	Val	Ile		
				965					970					975			
Asp	Asn	Phe	Tyr	Gly	Glu	Gly	Asp	Gly	Asn	Arg	Asn	Gln	Asn	Glu	Thr		
			980					985					990				
Gln	Val	Leu	Val	Val	Leu	Leu	Asp	Ile	Asn	Asp	Asn	Tyr	Pro	Glu	Leu		
		995					1000					1005					
Pro	Glu	Thr	Ile	Pro	Trp	Ala	Ile	Ser	Glu	Ser	Leu	Glu	Leu	Gly	Glu		
	1010					1015						1020					
Arg	Val	Gln	Pro	Glu	Ile	Phe	Ala	Arg	Asp	Arg	Asp	Glu	Pro	Gly	Thr		
1025					1030				1035						1040		
Asp	Asn	Ser	Arg	Val	Ala	Tyr	Ala	Ile	Thr	Gly	Leu	Ala	Ser	Thr	Asp		
				1045					1050						1055		
Arg	Asp	Ile	Gln	Val	Pro	Asn	Leu	Phe	Asn	Met	Ile	Thr	Ile	Glu	Arg		
			1060					1065					1070				
Asp	Arg	Gly	Ile	Asp	Gln	Thr	Gly	Ile	Leu	Glu	Ala	Ala	Met	Asp	Leu		
		1075					1080					1085					
Arg	Gly	Tyr	Trp	Gly	Thr	Tyr	Gln	Ile	Asp	Ile	Gln	Ala	Tyr	Asp	His		
	1090					1095					1100						
Gly	Ile	Pro	Gln	Arg	Ile	Ser	Asn	Gln	Lys	Tyr	Pro	Leu	Val	Ile	Arg		
1105					1110					1115					1120		
Pro	Tyr	Asn	Phe	His	Asp	Pro	Val	Phe	Val	Phe	Pro	Gln	Pro	Gly	Ser		
				1125					1130						1135		
Thr	Ile	Arg	Leu	Ala	Lys	Glu	Arg	Ala	Val	Val	Asn	Gly	Ile	Leu	Ala		
			1140					1145					1150				
Thr	Val	Asp	Gly	Glu	Phe	Leu	Asp	Arg	Ile	Val	Ala	Thr	Asp	Glu	Asp		
		1155					1160					1165					
Gly	Leu	Glu	Ala	Gly	Leu	Val	Thr	Phe	Ser	Ile	Ala	Gly	Asp	Asp	Glu		
	1170					1175					1180						
Asp	Ala	Gln	Phe	Phe	Asp	Val	Leu	Asn	Asp	Gly	Val	Asn	Ser	Gly	Ala		
1185					1190					1195					1200		
Leu	Thr	Leu	Thr	Arg	Leu	Phe	Pro	Glu	Glu	Phe	Arg	Glu	Phe	Gln	Val		
				1205					1210					1215			
Thr	Ile	Arg	Ala	Thr	Asp	Gly	Gly	Thr	Glu	Pro	Gly	Pro	Arg	Ser	Thr		
			1220					1225					1230				
Asp	Cys	Leu	Val	Thr	Val	Val	Phe	Val	Pro	Thr	Gln	Gly	Glu	Pro	Val		
		1235					1240					1245					
Phe	Glu	Asp	Arg	Thr	Tyr	Thr	Val	Ala	Phe	Val	Glu	Lys	Asp	Glu	Gly		
	1250					1255					1260						
Met	Leu	Glu	Glu	Ala	Glu	Leu	Pro	Arg	Ala	Ser	Asp	Pro	Arg	Asn	Ile		
1265					1270				1275						1280		
Met	Cys	Glu	Asp	Asp	Cys	His	Asp	Thr	Tyr	Tyr	Ser	Ile	Val	Gly	Gly		
				1285					1290						1295		
Asn	Ser	Gly	Glu	His	Phe	Thr	Val	Asp	Pro	Arg	Thr	Asn	Val	Leu	Ser		
		1300						1305					1310				
Leu	Val	Lys	Pro	Leu	Asp	Arg	Ser	Glu	Gln	Glu	Thr	His	Thr	Leu	Ile		
		1315					1320						1325				
Ile	Gly	Ala	Ser	Asp	Thr	Pro	Asn	Pro	Ala	Ala	Val	Leu	Gln	Ala	Ser		
	1330					1335					1340						
Thr	Leu	Thr	Val	Thr	Val	Asn	Val	Arg	Glu	Ala	Asn	Pro	Arg	Pro	Val		
1345					1350					1355					1360		
Phe	Gln	Arg	Ala	Leu	Tyr	Thr	Ala	Gly	Ile	Ser	Ala	Gly	Asp	Phe	Ile		
			1365						1370						1375		
Glu	Arg	Asn	Leu	Leu	Thr	Leu	Val	Ala	Thr	His	Ser	Glu	Asp	Leu	Pro		
			1380					1385					1390				
Ile	Thr	Tyr	Thr	Leu	Ile	Gln	Glu	Ser	Met	Glu	Ala	Asp	Pro	Thr	Leu		
	1395					1400						1405					
Glu	Ala	Val	Gln	Glu	Ser	Ala	Phe	Ile	Leu	Asn	Pro	Glu	Thr	Gly	Val		

1410	1415	1420
Leu Ser Leu Asn Phe Gln Pro Thr Ala Ser Met His Gly Met Phe Glu		
1425	1430	1435
Phe Glu Val Lys Ala Thr Asp Ser Arg Thr Glu Thr Ala Arg Thr Glu		1440
	1445	1450
Val Lys Val Tyr Leu Ile Ser Asp Arg Asn Arg Val Phe Phe Thr Phe		1455
	1460	1465
Asn Asn Pro Leu Pro Glu Val Thr Pro Gln Glu Asp Phe Ile Ala Glu		1470
	1475	1480
Thr Phe Thr Ala Phe Phe Gly Met Thr Cys Asn Ile Asp Gln Ser Trp		1485
	1490	1495
Trp Ala Ser Asp Pro Val Thr Gly Ala Thr Lys Asp Asp Gln Thr Glu		1500
1505	1510	1515
Val Arg Ala His Phe Ile Arg Asp Asp Leu Pro Val Pro Ala Glu Glu		1520
	1525	1530
Ile Glu Gln Leu Arg Gly Asn Pro Thr Leu Val Asn Ser Ile Gln Arg		1535
	1540	1545
Ala Leu Glu Glu Gln Asn Leu Gln Leu Ala Asp Leu Phe Thr Gly Glu		1550
	1555	1560
Thr Pro Ile Leu Gly Gly Asp Ala Gln Ala Arg Ala Leu Tyr Ala Leu		1565
	1570	1575
Ala Ala Val Ala Ala Ala Leu Ala Leu Ile Val Val Val Leu Leu Ile		1580
1585	1590	1595
Val Phe Phe Val Arg Thr Arg Thr Leu Asn Arg Arg Leu Gln Ala Leu		1600
	1605	1610
Ser Met Thr Lys Tyr Ser Ser Gln Asp Ser Gly Leu Asn Arg Val Gly		1615
	1620	1625
Leu Ala Ala Pro Gly Thr Asn Lys His Ala Val Glu Gly Ser Asn Pro		1630
	1635	1640
Ile Trp Asn Glu Thr Leu Lys Ala Pro Asp Phe Asp Ala Leu Ser Glu		1645
	1650	1655
Gln Ser Tyr Asp Ser Asp Leu Ile Gly Ile Glu Asp Leu Pro Gln Phe		1660
1665	1670	1675
Arg Asn Asp Tyr Phe Pro Pro Glu Glu Gly Ser Ser Met Arg Gly Val		1680
	1685	1690
Val Asn Glu His Val Pro Glu Ser Ile Ala Asn His Asn Asn Asn Phe		1695
	1700	1705
Gly Phe Asn Ser Thr Pro Phe Ser Pro Glu Phe Ala Asn Thr Gln Phe		1710
	1715	1720
Arg Arg		1725
1730		

<210> 8

<211> 1717

<212> PRT

<213> Ostrinia nubilalis

<400> 8

Met Gly Val Glu Arg Phe Phe Pro Ala Val Leu Leu Val Ser Leu Ala
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Ser Ala Ala Leu Ala Asn Gln Arg Cys Ser Tyr Ile Ile Ala Ile Pro
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Arg Pro Glu Thr Pro Glu Leu Pro Pro Ile Asp Tyr Glu Gly Lys Ser
35 40 45
Trp Ser Glu Gln Pro Leu Ile Pro Gly Pro Thr Arg Glu Glu Val Cys
50 55 60

Met	Glu	Asn	Phe	Leu	Pro	Asp	Gln	Met	Ile	Gln	Val	Ile	Tyr	Met	Glu
65					70					75					80
Glu	Glu	Ile	Glu	Gly	Asp	Val	Ile	Ile	Ala	Lys	Leu	Asn	Tyr	Gln	Gly
				85					90					95	
Ser	Asn	Thr	Pro	Val	Leu	Ser	Ile	Met	Ser	Gly	Gln	Pro	Arg	Ala	Gln
			100					105						110	
Leu	Gly	Pro	Glu	Phe	Arg	Gln	Asn	Glu	Ala	Asp	Gly	Gln	Trp	Ser	Leu
		115					120					125			
Val	Ile	Thr	Gln	Arg	Gln	Asp	Tyr	Glu	Thr	Ala	Thr	Met	Gln	Ser	Tyr
	130					135					140				
Val	Phe	Ser	Ile	Gln	Val	Glu	Gly	Glu	Ser	Gln	Ala	Val	Leu	Val	Ala
145					150					155					160
Leu	Glu	Ile	Val	Asn	Ile	Asp	Asp	Asn	Pro	Pro	Ile	Leu	Gln	Val	Val
				165					170					175	
Ser	Ala	Cys	Val	Ile	Pro	Glu	His	Gly	Glu	Ala	Arg	Leu	Thr	Asp	Cys
			180					185					190		
Val	Tyr	Gln	Val	Ser	Asp	Arg	Asp	Gly	Glu	Ile	Ser	Thr	Arg	Phe	Met
		195					200					205			
Thr	Phe	Arg	Val	Asp	Ser	Ser	Arg	Ala	Ala	Asp	Glu	Ser	Ile	Phe	Tyr
	210					215					220				
Met	Val	Gly	Glu	Tyr	Asp	Pro	Ser	Asp	Trp	Phe	Asn	Met	Lys	Met	Thr
225					230					235					240
Val	Gly	Ile	Asn	Ser	Pro	Leu	Asn	Phe	Glu	Thr	Thr	Gln	Leu	His	Ile
			245						250					255	
Phe	Ser	Val	Thr	Ala	Ser	Asp	Ser	Leu	Pro	Asn	Asn	His	Thr	Val	Thr
			260					265					270		
Met	Met	Val	Gln	Val	Glu	Asn	Val	Glu	Ser	Arg	Pro	Pro	Arg	Trp	Val
		275					280					285			
Glu	Ile	Phe	Ser	Val	Gln	Gln	Phe	Asp	Glu	Lys	Thr	Asn	Gln	Ser	Phe
	290					295					300				
Ser	Leu	Arg	Ala	Ile	Asp	Gly	Asp	Thr	Gly	Ile	Asn	Arg	Ala	Ile	Asn
305					310					315					320
Tyr	Thr	Leu	Ile	Arg	Asp	Asp	Ala	Asp	Asp	Phe	Phe	Ser	Leu	Glu	Val
				325					330					335	
Ile	Glu	Asp	Gly	Ala	Ile	Leu	His	Val	Thr	Glu	Ile	Asp	Arg	Asp	Lys
			340					345					350		
Leu	Glu	Arg	Glu	Leu	Phe	Asn	Leu	Thr	Ile	Val	Ala	Tyr	Lys	Ser	Thr
			355				360					365			
Asp	Ala	Ser	Phe	Ala	Thr	Glu	Ala	His	Ile	Phe	Ile	Ile	Val	Asn	Asp
	370					375					380				
Val	Asn	Asp	Gln	Arg	Pro	Glu	Pro	Leu	His	Lys	Glu	Tyr	Ser	Ile	Asp
385					390					395					400
Ile	Met	Glu	Glu	Thr	Pro	Met	Thr	Leu	Asn	Phe	Asn	Glu	Glu	Phe	Gly
				405					410					415	
Phe	His	Asp	Arg	Asp	Leu	Gly	Glu	Asn	Ala	Gln	Tyr	Thr	Val	Glu	Leu
			420					425					430		
Glu	Asp	Val	Phe	Pro	Pro	Gly	Ala	Ser	Ala	Phe	Tyr	Ile	Ala	Pro	
		435					440				445				
Gly	Ser	Gly	Tyr	Gln	Arg	Gln	Thr	Phe	Ile	Met	Gly	Thr	Ile	Asn	His
	450					455					460				
Thr	Met	Leu	Asp	Tyr	Glu	Asp	Val	Ile	Phe	Gln	Asn	Ile	Ile	Ile	Lys
465					470					475					480
Val	Lys	Ala	Val	Asp	Met	Asn	Asn	Ala	Ser	His	Val	Gly	Glu	Ala	Leu
				485					490					495	
Val	Tyr	Val	Asn	Leu	Ile	Asn	Trp	Asn	Asp	Glu	Leu	Pro	Ile	Phe	Glu
			500					505					510		
Glu	Ser	Ser	Tyr	Ser	Ala	Ser	Phe	Lys	Glu	Thr	Val	Gly	Ala	Gly	Phe

Asn Gln Asp Glu Val Glu Ile Phe Val Val Leu Leu Asp Val Asn Asp
 980 985 990
 Asn Ala Pro Glu Met Pro Leu Pro Asp Glu Leu Arg Phe Asp Val Ser
 995 1000 1005
 Glu Gly Ala Val Ala Gly Val Arg Val Leu Pro Glu Ile Tyr Ala Pro
 1010 1015 1020
 Asp Arg Asp Glu Pro Asp Thr Asp Asn Ser Arg Val Gly Tyr Gly Ile
 1025 1030 1035 1040
 Leu Asp Leu Thr Ile Thr Asp Arg Asp Ile Glu Val Pro Asp Leu Phe
 1045 1050 1055
 Thr Met Ile Ser Ile Glu Asn Lys Thr Gly Glu Leu Glu Thr Ala Met
 1060 1065 1070
 Asp Leu Arg Gly Tyr Trp Gly Thr Tyr Glu Ile Phe Ile Glu Ala Phe
 1075 1080 1085
 Asp His Gly Tyr Pro Gln Gln Arg Ser Asn Glu Thr Tyr Thr Leu Val
 1090 1095 1100
 Ile Arg Pro Tyr Asn Phe His His Pro Val Phe Val Phe Pro Gln Pro
 1105 1110 1115 1120
 Asp Ser Val Ile Arg Leu Ser Arg Glu Arg Ala Thr Glu Gly Gly Val
 1125 1130 1135
 Leu Ala Thr Ala Ala Asn Glu Phe Leu Glu Pro Ile Tyr Ala Thr Asp
 1140 1145 1150
 Glu Asp Gly Leu His Ala Gly Ser Val Thr Phe His Val Gln Gly Asn
 1155 1160 1165
 Glu Glu Ala Val Gln Tyr Phe Asp Ile Thr Glu Val Gly Ala Gly Glu
 1170 1175 1180
 Asn Ser Gly Gln Leu Ile Leu Arg Gln Leu Phe Pro Glu Gln Ile Arg
 1185 1190 1195 1200
 Gln Phe Arg Ile Thr Ile Arg Ala Thr Asp Gly Gly Thr Glu Pro Gly
 1205 1210 1215
 Pro Leu Trp Thr Asp Val Thr Phe Ser Val Val Phe Val Pro Thr Gln
 1220 1225 1230
 Gly Asp Pro Val Phe Ser Glu Asn Ala Ala Thr Val Ala Phe Phe Glu
 1235 1240 1245
 Gly Glu Glu Gly Leu Arg Glu Ser Phe Glu Leu Pro Gln Ala Glu Asp
 1250 1255 1260
 Leu Lys Asn His Leu Cys Glu Asp Asp Cys Gln Asp Ile Tyr Tyr Arg
 1265 1270 1275 1280
 Phe Ile Asp Gly Asn Asn Glu Gly Leu Phe Val Leu Asp Gln Ser Ser
 1285 1290 1295
 Asn Val Ile Ser Leu Ala Gln Glu Leu Asp Arg Glu Val Ala Thr Ser
 1300 1305 1310
 Tyr Thr Leu His Ile Ala Ala Ser Asn Ser Pro Asp Ala Thr Gly Ile
 1315 1320 1325
 Pro Leu Gln Thr Ser Ile Leu Val Val Thr Val Asn Val Arg Glu Ala
 1330 1335 1340
 Asn Pro Arg Pro Ile Phe Glu Gln Asp Leu Tyr Thr Ala Gly Ile Ser
 1345 1350 1355 1360
 Thr Leu Asp Ser Ile Gly Arg Glu Leu Leu Thr Val Arg Ala Ser His
 1365 1370 1375
 Thr Glu Asp Asp Thr Ile Thr Tyr Thr Ile Asp Arg Ala Ser Met Gln
 1380 1385 1390
 Leu Asp Ser Ser Leu Glu Ala Val Arg Asp Ser Ala Phe Ala Leu His
 1395 1400 1405
 Ala Thr Thr Gly Val Leu Ser Leu Asn Met Gln Pro Thr Ala Ser Met
 1410 1415 1420
 His Gly Met Phe Glu Phe Asp Val Ile Ala Thr Asp Thr Ala Ser Ala

1425		1430		1435		1440
Ile Asp Thr Ala Arg Val Lys Val Tyr Leu Ile Ser Ser Gln Asn Arg						
	1445		1450		1455	
Val Thr Phe Ile Phe Asp Asn Gln Leu Glu Thr Val Glu Gln Asn Arg						
	1460		1465		1470	
Asn Phe Ile Ala Ala Thr Phe Ser Thr Gly Phe Asn Met Thr Cys Asn						
	1475		1480		1485	
Ile Asp Gln Val Val Pro Phe Ser Asp Ser Ser Gly Val Ala Gln Asp						
	1490		1495		1500	
Asp Thr Thr Glu Val Arg Ala His Phe Ile Arg Asp Asn Val Pro Val						
1505		1510		1515		1520
Gln Ala Gln Glu Val Glu Ala Val Arg Ser Asp Thr Val Leu Leu Arg						
	1525		1530		1535	
Thr Ile Gln Leu Met Leu Ser Thr Asn Ser Leu Val Leu Gln Asp Leu						
	1540		1545		1550	
Val Thr Gly Asp Thr Pro Thr Leu Gly Glu Glu Ser Met Gln Ile Ala						
	1555		1560		1565	
Val Tyr Ala Leu Ala Ala Leu Ser Ala Val Leu Gly Phe Leu Cys Leu						
	1570		1575		1580	
Val Leu Leu Leu Ala Leu Phe Cys Arg Thr Arg Ala Leu Asn Arg Gln						
1585		1590		1595		1600
Leu Gln Ala Leu Ser Met Thr Lys Tyr Gly Ser Val Asp Ser Gly Leu						
	1605		1610		1615	
Asn Arg Ala Gly Leu Ala Pro Gly Thr Asn Lys His Ala Val Glu Gly						
	1620		1625		1630	
Ser Asn Pro Met Trp Asn Glu Ala Ile Arg Ala Pro Asp Phe Asp Ala						
	1635		1640		1645	
Ile Ser Asp Ala Ser Gly Asp Ser Asp Leu Ile Gly Ile Glu Asp Met						
	1650		1655		1660	
Pro Gln Phe Arg Asp Asp Tyr Phe Pro Pro Gly Asp Thr Asp Ser Ser						
1665		1670		1675		1680
Ser Gly Ile Val Leu His Met Gly Glu Ala Thr Asp Asn Lys Pro Val						
	1685		1690		1695	
Thr Thr His Gly Asn Asn Phe Gly Phe Lys Ser Thr Pro Tyr Leu Pro						
	1700		1705		1710	
Gln Pro His Pro Lys						
	1715					

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 <212> PRT
 <213> Bombyx mori

<400> 9
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1 5 10 15
Glu Thr Val Leu Ala Gln Glu Arg Cys Gly Phe Met Val Ala Ile Pro
20 25 30
Arg Pro Pro Arg Pro Asp Leu Pro Glu Leu Asp Phe Glu Gly Gln Thr
35 40 45
Trp Ser Gln Arg Pro Leu Ile Pro Ala Ala Asp Arg Glu Asp Val Cys
50 55 60
Met Asp Gly Tyr His Ala Met Thr Pro Thr Tyr Gly Thr Gln Ile Ile
65 70 75 80
Tyr Met Glu Glu Glu Ile Glu Gly Glu Val Pro Ile Ala Lys Leu Asn
85 90 95

Tyr	Arg	Gly	Pro	Asn	Val	Pro	Tyr	Ile	Glu	Pro	Ala	Phe	Leu	Ser	Gly		
			100					105					110				
Ser	Phe	Asn	Leu	Leu	Val	Pro	Val	Ile	Arg	Arg	Ile	Pro	Asp	Ser	Asn		
		115					120					125					
Gly	Glu	Trp	His	Leu	Ile	Ile	Thr	Gln	Arg	Gln	Asp	Tyr	Glu	Thr	Pro		
	130				135						140						
Gly	Met	Gln	Gln	Tyr	Val	Phe	Asn	Ile	Arg	Ile	Asp	Gly	Glu	Thr	Leu		
145				150					155						160		
Val	Ala	Gly	Val	Ser	Leu	Leu	Ile	Val	Asn	Ile	Asp	Asp	Asn	Ala	Pro		
				165					170						175		
Ile	Ile	Gln	Ala	Leu	Glu	Pro	Cys	Gln	Val	Asp	Glu	Leu	Gly	Glu	Ala		
			180					185					190				
Arg	Leu	Thr	Glu	Cys	Val	Tyr	Val	Val	Thr	Asp	Ala	Asp	Gly	Arg	Ile		
		195					200					205					
Ser	Thr	Gln	Phe	Met	Gln	Phe	Arg	Ile	Asp	Ser	Asp	Arg	Gly	Asp	Asp		
	210					215					220						
Lys	Ile	Phe	Tyr	Ile	Gln	Gly	Ala	Asn	Ile	Pro	Gly	Glu	Trp	Ile	Arg		
225				230					235						240		
Met	Thr	Met	Thr	Val	Gly	Ile	Asn	Glu	Pro	Leu	Asn	Phe	Glu	Thr	Asn		
				245					250						255		
Pro	Leu	His	Ile	Phe	Ser	Val	Thr	Ala	Leu	Asp	Ser	Leu	Pro	Asn	Thr		
			260					265						270			
His	Thr	Val	Thr	Leu	Met	Val	Gln	Val	Glu	Asn	Val	Glu	His	Arg	Pro		
		275					280					285					
Pro	Arg	Trp	Val	Glu	Ile	Phe	Ala	Val	Gln	Gln	Phe	Asp	Glu	Lys	Thr		
	290					295					300						
Ala	Gln	Ser	Phe	Pro	Val	Arg	Ala	Ile	Asp	Gly	Asp	Thr	Gly	Ile	Asn		
305				310					315						320		
Lys	Pro	Ile	His	Tyr	Arg	Leu	Glu	Thr	Ala	Glu	Glu	Asp	Thr	Phe	Phe		
				325					330					335			
His	Ile	Arg	Thr	Ile	Glu	Gly	Gly	Arg	Ser	Gly	Ala	Ile	Leu	Tyr	Val		
			340					345					350				
Asp	Pro	Ile	Asp	Arg	Asp	Thr	Leu	Gln	Arg	Glu	Val	Phe	Gln	Leu	Ser		
		355					360					365					
Ile	Ile	Ala	Tyr	Lys	Tyr	Asp	Asn	Glu	Ser	Ser	Ala	Thr	Ala	Ala	Asn		
	370					375					380						
Val	Val	Ile	Ile	Val	Asn	Asp	Ile	Asn	Asp	Gln	Arg	Pro	Glu	Pro	Leu		
385				390					395						400		
Phe	Lys	Glu	Tyr	Arg	Leu	Asn	Ile	Met	Glu	Glu	Thr	Ala	Leu	Thr	Leu		
				405					410						415		
Asn	Phe	Asp	Gln	Glu	Phe	Gly	Phe	His	Asp	Arg	Asp	Leu	Gly	Gln	Asn		
			420					425					430				
Ala	Gln	Tyr	Thr	Val	Arg	Leu	Glu	Ser	Asp	Tyr	Pro	Ala	Asp	Ala	Ala		
	435						440					445					
Lys	Ala	Phe	Tyr	Ile	Ala	Pro	Glu	Val	Gly	Tyr	Gln	Arg	Gln	Thr	Phe		
	450					455					460						
Ile	Met	Gly	Thr	Ala	Asn	His	Lys	Met	Leu	Asp	Tyr	Glu	Val	Pro	Glu		
465				470					475						480		
Phe	Gln	Arg	Ile	Arg	Leu	Arg	Val	Ile	Ala	Thr	Asp	Met	Asp	Asn	Glu		
				485					490					495			
Glu	His	Val	Gly	Val	Ala	Tyr	Val	Tyr	Ile	Asn	Leu	Ile	Asn	Trp	Asn		
			500					505					510				
Asp	Glu	Glu	Pro	Ile	Phe	Glu	His	Ser	Val	Gln	Asn	Val	Ser	Phe	Lys		
	515						520					525					
Glu	Thr	Glu	Gly	Lys	Gly	Phe	Phe	Val	Ala	Asn	Val	Arg	Ala	His	Asp		
	530					535					540						
Arg	Asp	Ile	Asp	Asp	Arg	Val	Glu	His	Thr	Leu	Met	Gly	Asn	Ala	Asn		

545	Asn	Tyr	Leu	Ser	Ile	Asp	Lys	Asp	Thr	Gly	Asp	Ile	His	Val	Thr	Gln	550	555	560
	Asp	Asp	Phe	Phe	Asp	Tyr	His	Arg	Gln	Ser	Glu	Leu	Phe	Val	Gln	Val	565	570	575
	Arg	Ala	Asp	Asp	Thr	Leu	Gly	Glu	Pro	Phe	His	Thr	Ala	Thr	Ser	Gln	580	585	590
	Leu	Leu	Ile	His	Leu	Glu	Asp	Ile	Asn	Asn	Thr	Pro	Pro	Thr	Leu	Arg	595	600	605
	Leu	Pro	Arg	Gly	Ser	Pro	Asn	Val	Glu	Glu	Asn	Val	Pro	Glu	Gly	Tyr	610	615	620
	Ile	Ile	Thr	Ser	Glu	Ile	Arg	Ala	Thr	Asp	Pro	Asp	Thr	Thr	Ala	Glu	625	630	635
	Leu	Arg	Phe	Glu	Ile	Asp	Trp	Thr	Thr	Ser	Tyr	Ala	Thr	Lys	Gln	Gly	645	650	655
	Arg	Glu	Ala	Asn	Pro	Ile	Glu	Phe	His	Asn	Cys	Val	Glu	Ile	Glu	Thr	660	665	670
	Ile	Tyr	Pro	Ala	Ile	Asn	Asn	Arg	Gly	Ser	Ala	Ile	Gly	Arg	Leu	Val	675	680	685
	Val	Lys	Lys	Ile	Arg	Glu	Asn	Val	Thr	Ile	Asp	Tyr	Glu	Glu	Phe	Glu	690	695	700
	Met	Leu	Tyr	Leu	Thr	Val	Arg	Val	Arg	Asp	Leu	Asn	Thr	Val	Ile	Gly	705	710	715
	Asp	Asp	Tyr	Asp	Glu	Ser	Thr	Phe	Thr	Ile	Thr	Ile	Ile	Asp	Met	Asn	725	730	735
	Asp	Asn	Pro	Pro	Ile	Trp	Val	Pro	Gly	Thr	Leu	Glu	Gln	Ser	Leu	Arg	740	745	750
	Val	Arg	Glu	Met	Ser	Asp	Ala	Gly	Val	Val	Ile	Gly	Thr	Leu	Thr	Ala	755	760	765
	Thr	Asp	Ile	Asp	Gly	Pro	Leu	Tyr	Asn	Gln	Val	Arg	Tyr	Thr	Met	Lys	770	775	780
	Ala	Asn	Glu	Gly	Thr	Pro	Glu	Asn	Leu	Leu	Met	Ile	Asp	Phe	Tyr	Thr	785	790	795
	Gly	Gln	Ile	Thr	Val	Lys	Thr	Ser	Gly	Ala	Ile	Asp	Ala	Asp	Val	Pro	805	810	815
	Arg	Arg	Tyr	Asn	Leu	Tyr	Tyr	Thr	Val	Val	Ala	Thr	Asp	Arg	Cys	Tyr	820	825	830
	Ala	Glu	Asp	Pro	Asp	Asp	Cys	Pro	Asp	Asp	Pro	Thr	Tyr	Trp	Glu	Thr	835	840	845
	Pro	Gly	Gln	Val	Val	Ile	Gln	Ile	Ile	Asp	Thr	Asn	Asn	Lys	Ile	Pro	850	855	860
	Gln	Pro	Glu	Thr	Asp	Gln	Phe	Lys	Ala	Val	Val	Tyr	Ile	Tyr	Glu	Asp	865	870	875
	Ala	Val	Ser	Gly	Asp	Glu	Val	Val	Lys	Val	Ile	Gly	Ser	Asp	Leu	Asp	885	890	895
	Arg	Asp	Asp	Ile	Tyr	His	Thr	Ile	Arg	Tyr	Gln	Ile	Asn	Tyr	Ala	Val	900	905	910
	Asn	Pro	Arg	Leu	Arg	Asp	Phe	Phe	Ala	Val	Asp	Pro	Asp	Thr	Gly	Arg	915	920	925
	Val	Tyr	Val	Tyr	Tyr	Thr	Thr	Asp	Glu	Val	Leu	Asp	Arg	Asp	Gly	Asp	930	935	940
	Glu	Pro	Gln	His	Arg	Ile	Phe	Phe	Asn	Leu	Ile	Asp	Asn	Phe	Phe	Gln	945	950	955
	Gln	Gly	Asp	Gly	Asn	Arg	Asn	Gln	Asn	Asp	Ala	Glu	Val	Leu	Val	Val	965	970	975
	Leu	Leu	Asp	Val	Asn	Asp	Asn	Ala	Pro	Glu	Leu	Pro	Glu	Pro	Asp	Glu	980	985	990

Leu Ser Trp Ser Val Ser Glu Ser Leu Thr Lys Gly Thr Arg Leu Gln
 1010 1015 1020
 Pro His Ile Tyr Ala Pro Asp Arg Asp Glu Pro Asp Thr Asp Asn Ser
 1025 1030 1035 1040
 Arg Val Gly Tyr Ala Ile Ile Ser Leu Thr Ile Ala Asn Arg Glu Ile
 1045 1050 1055
 Glu Val Pro Glu Leu Phe Thr Met Ile Gln Ile Gln Asn Val Thr Gly
 1060 1065 1070
 Glu Leu Glu Thr Ala Met Asp Leu Arg Gly Tyr Trp Gly Thr Tyr Ala
 1075 1080 1085
 Ile His Ile Lys Ala Tyr Asp His Gly Ile Pro Gln Gln Met Ser Asn
 1090 1095 1100
 Glu Thr Tyr Glu Leu Val Ile Arg Pro Tyr Asn Phe His Ala Pro Val
 1105 1110 1115 1120
 Phe Val Phe Pro Lys His Gly Ala Thr Leu Arg Leu Ala Arg Glu Arg
 1125 1130 1135
 Ala Val Val Asn Gly Leu Leu Ala Thr Val Asp Gly Glu Phe Leu Asn
 1140 1145 1150
 Arg Ile Val Ala Thr Asp Glu Asp Gly Leu His Ala Gly Gln Val Ala
 1155 1160 1165
 Phe Glu Val Val Gly Asp Thr Glu Ala Val Asp Tyr Phe His Ile Val
 1170 1175 1180
 Asn Asp Gly Glu Asn Ser Gly Thr Leu Met Leu Lys Gln Leu Phe Pro
 1185 1190 1195 1200
 Glu Asp Ile Arg Glu Phe Glu Val Thr Ile Arg Ala Thr Asp Gly Gly
 1205 1210 1215
 Thr Glu Pro Arg Pro Leu Ser Thr Asp Cys Thr Phe Ser Val Val Phe
 1220 1225 1230
 Val Pro Ile Gln Gly Glu Pro Ile Phe Pro Thr Ser Thr His Thr Val
 1235 1240 1245
 Ala Phe Ile Glu Lys Glu Ala Gly Leu Leu Glu Arg His Glu Leu Pro
 1250 1255 1260
 Arg Ala Glu Asp Arg Lys Asn His Leu Cys Ser Asp Asp Cys His Asn
 1265 1270 1275 1280
 Ile Tyr Tyr Arg Ile Ile Asp Gly Asn Asn Asp Gly His Phe Gly Leu
 1285 1290 1295
 Asp Glu Thr Thr Asn Val Leu Phe Leu Val Lys Glu Leu Asp Arg Ser
 1300 1305 1310
 Val Ser Glu Thr Tyr Thr Leu Thr Ile Ala Ala Ser Asn Ser Pro Thr
 1315 1320 1325
 Gly Gly Ile Ala Leu Thr Ser Thr Ile Thr Ile Thr Val Asn Val Arg
 1330 1335 1340
 Glu Ala Asp Pro Gln Pro Tyr Phe Val Arg Asp Leu Tyr Thr Ala Gly
 1345 1350 1355 1360
 Ile Ser Thr Ser Asp Ser Ile Asn Arg Glu Leu Leu Ile Leu Gln Ala
 1365 1370 1375
 Thr His Ser Glu Asn Ala Pro Ile Ile Tyr Thr Ile Asp Trp Ser Thr
 1380 1385 1390
 Met Val Thr Asp Pro Thr Leu Ala Ser Val Arg Glu Thr Ala Phe Ile
 1395 1400 1405
 Leu Asn Pro His Thr Gly Val Leu Thr Leu Asn Ile Gln Pro Thr Ala
 1410 1415 1420
 Ser Met His Gly Met Phe Glu Phe Gln Val Val Ala Thr Asp Pro Ala
 1425 1430 1435 1440
 Gly Tyr Ser Asp Arg Ala Asn Val Lys Ile Tyr Leu Ile Ser Thr Arg
 1445 1450 1455
 Asn Arg Val Phe Phe Leu Phe Val Asn Thr Leu Glu Gln Val Glu Gln

Glu	Trp	His	Leu	Ile	Ile	Thr	Gln	Arg	Gln	His	Tyr	Glu	Leu	Pro	Gly		
130						135				140							
Met	Gln	Gln	Tyr	Met	Phe	Asn	Val	Arg	Val	Asp	Gly	Gln	Ser	Leu	Val		
145					150					155					160		
Ala	Gly	Val	Ser	Leu	Ala	Ile	Val	Asn	Ile	Asp	Asp	Asn	Ala	Pro	Ile		
				165					170					175			
Ile	Gln	Asn	Phe	Glu	Pro	Cys	Arg	Val	Pro	Glu	Leu	Gly	Glu	Pro	Gly		
			180					185					190				
Leu	Thr	Glu	Cys	Thr	Tyr	Gln	Val	Ser	Asp	Ala	Asp	Gly	Arg	Ile	Ser		
		195				200						205					
Thr	Glu	Phe	Met	Thr	Phe	Arg	Ile	Asp	Ser	Val	Arg	Gly	Asp	Glu	Glu		
	210					215					220						
Thr	Phe	Tyr	Ile	Glu	Arg	Thr	Asn	Ile	Pro	Asn	Gln	Trp	Met	Trp	Leu		
225					230					235					240		
Asn	Met	Thr	Ile	Gly	Val	Asn	Thr	Ser	Leu	Asn	Phe	Val	Thr	Ser	Pro		
			245						250					255			
Leu	His	Ile	Phe	Ser	Val	Thr	Ala	Leu	Asp	Ser	Leu	Pro	Asn	Thr	His		
			260					265					270				
Thr	Val	Thr	Met	Met	Val	Gln	Val	Ala	Asn	Val	Asn	Ser	Arg	Pro	Pro		
		275				280						285					
Arg	Trp	Leu	Glu	Ile	Phe	Ala	Val	Gln	Gln	Phe	Glu	Glu	Lys	Ser	Tyr		
	290					295					300						
Gln	Asn	Phe	Thr	Val	Arg	Ala	Ile	Asp	Gly	Asp	Thr	Glu	Ile	Asn	Met		
305					310					315					320		
Pro	Ile	Asn	Tyr	Arg	Leu	Ile	Thr	Asn	Glu	Glu	Asp	Thr	Phe	Phe	Ser		
			325						330					335			
Ile	Glu	Ala	Leu	Pro	Gly	Gly	Lys	Ser	Gly	Ala	Val	Phe	Leu	Val	Ser		
			340					345					350				
Pro	Ile	Asp	Arg	Asp	Thr	Leu	Gln	Arg	Glu	Val	Phe	Pro	Leu	Thr	Ile		
		355					360					365					
Val	Ala	Tyr	Lys	Tyr	Asp	Glu	Glu	Ala	Phe	Ser	Thr	Ser	Thr	Asn	Val		
	370					375					380						
Val	Ile	Ile	Val	Thr	Asp	Ile	Asn	Asp	Gln	Arg	Pro	Glu	Pro	Ile	His		
385					390					395					400		
Lys	Glu	Tyr	Arg	Leu	Ala	Ile	Met	Glu	Glu	Thr	Pro	Leu	Thr	Leu	Asn		
				405					410					415			
Phe	Asp	Lys	Glu	Phe	Gly	Phe	His	Asp	Lys	Asp	Leu	Gly	Gln	Asn	Ala		
			420					425					430				
Gln	Tyr	Thr	Val	Arg	Leu	Glu	Ser	Val	Asp	Pro	Pro	Gly	Ala	Ala	Glu		
		435					440					445					
Ala	Phe	Tyr	Ile	Ala	Pro	Glu	Val	Gly	Tyr	Gln	Arg	Gln	Thr	Phe	Ile		
	450					455					460						
Met	Gly	Thr	Leu	Asn	His	Ser	Met	Leu	Asp	Tyr	Glu	Val	Pro	Glu	Phe		
465					470					475					480		
Gln	Ser	Ile	Thr	Ile	Arg	Val	Val	Ala	Thr	Asp	Asn	Asn	Asp	Thr	Arg		
				485					490					495			
His	Val	Gly	Val	Ala	Leu	Val	His	Ile	Asp	Leu	Ile	Asn	Trp	Asn	Asp		
			500					505					510				
Glu	Gln	Pro	Ile	Phe	Glu	His	Ala	Val	Gln	Thr	Val	Thr	Phe	Asp	Glu		
		515					520					525					
Thr	Glu	Gly	Glu	Gly	Phe	Phe	Val	Ala	Lys	Ala	Val	Ala	His	Asp	Arg		
	530					535					540						
Asp	Ile	Gly	Asp	Val	Val	Glu	His	Thr	Leu	Leu	Gly	Asn	Ala	Val	Asn		
545					550					555					560		
Phe	Leu	Thr	Ile	Asp	Lys	Leu	Thr	Gly	Asp	Ile	Arg	Val	Ser	Ala	Asn		
				565					570					575			
Asp	Ser	Phe	Asn	Tyr	His	Arg	Glu	Ser	Glu	Leu	Phe	Val	Gln	Val	Arg		

Asn	Ser	Arg	Val	Gly	Tyr	Glu	Ile	Leu	Asn	Leu	Ser	Thr	Glu	Arg	Asp	
				1045					1050					1055		
Ile	Glu	Val	Pro	Glu	Leu	Phe	Val	Met	Ile	Gln	Ile	Ala	Asn	Val	Thr	
			1060					1065					1070			
Gly	Glu	Leu	Glu	Thr	Ala	Met	Asp	Leu	Lys	Gly	Tyr	Trp	Gly	Thr	Tyr	
		1075					1080					1085				
Ala	Ile	His	Ile	Arg	Ala	Phe	Asp	His	Gly	Ile	Pro	Gln	Met	Ser	Met	
	1090					1095					1100					
Asn	Glu	Thr	Tyr	Glu	Leu	Ile	Ile	His	Pro	Phe	Asn	Tyr	Tyr	Ala	Pro	
1105					1110					1115				1120		
Glu	Phe	Val	Phe	Pro	Thr	Asn	Asp	Ala	Val	Ile	Arg	Leu	Ala	Arg	Glu	
				1125					1130					1135		
Arg	Ala	Val	Ile	Asn	Gly	Val	Leu	Ala	Thr	Val	Asn	Gly	Glu	Phe	Leu	
			1140					1145					1150			
Glu	Arg	Ile	Ser	Ala	Thr	Asp	Pro	Asp	Gly	Leu	His	Ala	Gly	Val	Val	
		1155					1160					1165				
Thr	Phe	Gln	Val	Val	Gly	Asp	Glu	Glu	Ser	Gln	Arg	Tyr	Phe	Gln	Val	
	1170					1175					1180					
Val	Asn	Asp	Gly	Glu	Asn	Leu	Gly	Ser	Leu	Arg	Leu	Leu	Gln	Ala	Val	
1185					1190					1195				1200		
Pro	Glu	Glu	Ile	Arg	Glu	Phe	Arg	Ile	Thr	Ile	Arg	Ala	Thr	Asp	Gln	
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Gly	Thr	Asp	Pro	Gly	Pro	Leu	Ser	Thr	Asp	Met	Thr	Phe	Arg	Val	Val	
		1220						1225					1230			
Phe	Val	Pro	Thr	Gln	Gly	Glu	Pro	Arg	Phe	Ala	Ser	Ser	Glu	His	Ala	
	1235						1240					1245				
Val	Ala	Phe	Ile	Glu	Lys	Ser	Ala	Gly	Met	Glu	Glu	Ser	His	Gln	Leu	
	1250					1255					1260					
Pro	Leu	Ala	Gln	Asp	Ile	Lys	Asn	His	Leu	Cys	Glu	Asp	Asp	Cys	His	
1265					1270					1275				1280		
Ser	Ile	Tyr	Tyr	Arg	Ile	Ile	Asp	Gly	Asn	Ser	Glu	Gly	His	Phe	Gly	
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Leu	Asp	Pro	Val	Arg	Asn	Arg	Leu	Phe	Leu	Lys	Lys	Glu	Leu	Ile	Arg	
			1300					1305					1310			
Glu	Gln	Ser	Ala	Ser	His	Thr	Leu	Gln	Val	Ala	Ala	Ser	Asn	Ser	Pro	
		1315					1320					1325				
Asp	Gly	Gly	Ile	Pro	Leu	Pro	Ala	Ser	Ile	Leu	Thr	Val	Thr	Val	Thr	
	1330					1335					1340					
Val	Arg	Glu	Ala	Asp	Pro	Arg	Pro	Val	Phe	Val	Arg	Glu	Leu	Tyr	Thr	
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Ala	Gly	Ile	Ser	Thr	Ala	Asp	Ser	Ile	Gly	Arg	Glu	Leu	Leu	Arg	Leu	
				1365					1370					1375		
His	Ala	Thr	Gln	Ser	Glu	Gly	Ser	Ala	Ile	Thr	Tyr	Ala	Ile	Asp	Tyr	
		1380						1385					1390			
Asp	Thr	Met	Val	Val	Asp	Pro	Ser	Leu	Glu	Ala	Val	Arg	Gln	Ser	Ala	
		1395					1400					1405				
Phe	Val	Leu	Asn	Ala	Gln	Thr	Gly	Val	Leu	Thr	Leu	Asn	Ile	Gln	Pro	
	1410					1415					1420					
Thr	Ala	Thr	Met	His	Gly	Leu	Phe	Lys	Phe	Glu	Val	Thr	Ala	Thr	Asp	
1425					1430					1435				1440		
Thr	Ala	Gly	Ala	Gln	Asp	Arg	Thr	Asp	Val	Thr	Val	Tyr	Val	Val	Ser	
				1445					1450					1455		
Ser	Gln	Asn	Arg	Val	Tyr	Phe	Val	Phe	Val	Asn	Thr	Leu	Gln	Gln	Val	
			1460					1465					1470			
Glu	Asp	Asn	Arg	Asp	Phe	Ile	Ala	Asp	Thr	Phe	Ser	Ala	Gly	Phe	Asn	
	1475						1480					1485				
Met	Thr	Cys	Asn	Ile	Asp	Gln	Val	Val	Pro	Ala	Asn	Asp	Pro	Val	Thr	

1490		1495		1500
Gly Val Ala Leu Glu His Ser Thr Gln Met Arg Gly His Phe Ile Arg				
1505		1510		1520
Asp Asn Val Pro Val Leu Ala Asp Glu Ile Glu Gln Ile Arg Ser Asp				
	1525		1530	1535
Leu Val Leu Leu Ser Ser Ile Gln Thr Thr Leu Ala Ala Arg Ser Leu				
	1540		1545	1550
Val Leu Gln Asp Leu Leu Thr Asn Ser Ser Pro Asp Ser Ala Pro Asp				
	1555		1560	1565
Ser Ser Leu Thr Val Tyr Val Leu Ala Ser Leu Ser Ala Val Leu Gly				
	1570		1575	1580
Phe Met Cys Leu Val Leu Leu Leu Thr Phe Ile Ile Arg Thr Arg Ala				
1585		1590		1600
Leu Asn Arg Arg Leu Glu Ala Leu Ser Met Thr Lys Tyr Gly Ser Leu				
	1605		1610	1615
Asp Ser Gly Leu Asn Arg Ala Gly Ile Ala Ala Pro Gly Thr Asn Lys				
	1620		1625	1630
His Thr Val Glu Gly Ser Asn Pro Ile Phe Asn Glu Ala Ile Lys Thr				
	1635		1640	1645
Pro Asp Leu Asp Ala Ile Ser Glu Gly Ser Asn Asp Ser Asp Leu Ile				
	1650		1655	1660
Gly Ile Glu Asp Leu Pro His Phe Gly Asn Val Phe Met Asp Pro Glu				
1665		1670		1680
Val Asn Glu Lys Ala Asn Gly Tyr Pro Glu Val Ala Asn His Asn Asn				
	1685		1690	1695
Asn Phe Ala Phe Asn Pro Thr Pro Phe Ser Pro Glu Phe Val Asn Gly				
	1700		1705	1710
Gln Phe Arg Lys Ile				
1715				